Elaine McCluskey

From: Elaine McCluskey [mccluskey@fnal.gov]

Sent: Wednesday, August 11, 2004 2:12 PM

To: 'David Finley'; 'Bill Foster'; 'Vic Kuchler'; 'Tom Lackowski'; 'Shekhar Mishra'; 'Dixon Bogert'; 'Elaine McCluskey'; 'Ed Crumpley'; 'Weiren Chou'; 'Duane Plant'; 'Chuck Federowicz'; 'Rich Stanek'; 'fgarcia@fnal.gov'

Subject: Notes from 8/11/04 Proton Driver Meeting

NO MEETING NEXT WEEK, 8/18/04. NEXT MEETING IS 8/25/04

Here are my notes from the meeting:

Attendees: Bill Foster, Duane Plant, Fernanda Garcia, Rich Stanek, Chuck Federowicz, Shekhar Mishra, Vic Kuchler, Elaine McCluskey

Items discussed:

1. Old cost estimates: Rich asked about level of detail on the previously issued 8GeV Superconducting Proton Linac and 8 GeV Synchrotron Proton Driver from the May 2002 report. Elaine indicated the linac version had more detail, but gave Rich the backup for both from the FESS project files. In the future, a more detailed version will need to be generated in order to do a better comparison, but not now.

2. Muon Rings: Chuck showed the layouts he'd done from information drawn from Dave Neuffer. Layouts assume linear alignment of rings as Dave had shown. Linearity may not be required, as Neuffer drawings was probably schematic. However, conclusion is it does fit inside Main Ring. One point brought out was that the beginning of the injection into Storage Ring would be at the end of the 700m Proton Driver straight section. Bill said parameters of muon rings would be reviewed in a possible Accelerator Physics meeting. Final point is that no additional work is necessary at this time for layout purposes, since it's been shown the rings will work.

3. FEL: Discussions of how FEL fits either inside the Main Ring or beyond. With north alignment of PD, could go beyond CDF to open areas northeast of Main Ring for FEL. With south alignment, could make slight bend and use open area southeast of Main Ring. Bill committed to finding out answers for what the proper radius is from the PD to the FEL – current "Booster-size" may be wrong. Bill is also going to talk to others to get a better sense about the feasibility of running the linac backwards to make the "outside the Main Ring" FEL scenarios more plausible.

4. Environmental considerations: Review of meeting held between Chuck, Elaine, & Rod Walton that was detailed in prior email, and repeated here:

   Two environmental activities need to happen before construction (CD-2) could begin on this project:

   1) NEPA determination by DOE. This is an assessment of the environmental impact of the project, including prairie, wetlands, animal/plant species.

      A preliminary document from Fermilab to DOE would be generated that would outline the level of review that would be necessary.

      The eventual document (Environmental Assessment or EIS) would have to demonstrate that other alternate locations have been identified and their environmental impacts reviewed.

      Part of the actual NEPA review process is a likely public hearing or meeting.

   2) The other activity is obtaining a permit to impact the wetlands. This is issued by the US Army Corps of Engineers, and is called a 404 permit. We would have consultants knowledgeable in the process a to do a wetlands study. Rod Walton has recommended a firm we've used before, EnCAP of DeKalb, who worked with us on the NuMI EAV 4 issues.

      Bringing in a consultant before CD-0 would help us know how much land might be impacted and some ballpark costs for mitigation that could be included in a CD-0 report. Rod recommended

against doing any mitigation before the actual construction project. This work is best done as part of the project itself.

The final NEPA determination needs to be given before CD-2 (which is permission to do detailed design) can be issued. Rod believes the whole NEPA process could take as long as 3 years. The wetlands delineation and permitting can be done in parallel with the NEPA determination.

Other items to note:
The lab ESH group would be involved in preparing paperwork for DOE on whatever permitting is required, but all other wetlands and environmental action would be sheparded by Rod.

5. Alignment of PD as it comes into 8GeV/MI intersection: The transfer line length and alignment was discussed. The length should be assumed between .75 and 1 km. This is much greater than the 2002 8GeV Superconducting Proton Linac, and may add as much as $17M to the project. Having it bend sharper from the intersection with MI would allow the transfer line to move further north and the linac would not have such a large environmental impact inside the Main Ring. It also may be possible to use parts of the existing 8GeV transfer line, which could save significantly on civil construction through this congested area. Key to this potential is understanding what's possible physics-wise and to not limit the potential for upgrades in the future. Bill will be talking to others about what is possible here.

6. Not reported in the meeting, because not all information was gathered, but Elaine did hear from an engineer at SNS who works with Jim Lawson, and he committed to emailing the shielding assessment they did for the SNS linac. He said that the 30 ft shielding was not used, and the shielding assessment documents this.

ITEMS FOR THE NEXT MEETING:
No new layouts required, unless Chuck is notified before the next meeting.

FESS will work on cross-sections and cost estimates for

- Linac with MI shielding and with 15' shielding, to help with argument about whether it's worth spending money to do further shielding studies or not
- Linac/klystron gallery with sloped excavations and with retaining walls, to look at difference

Elaine should also have information from SNS by then on actual shielding at their linac.

Bill will be looking into the following:

- Better sense about the feasibility of running the linac backwards to make the "outside the Main Ring" FEL scenarios more plausible.
- Proper radius from PD to FEL
- Possibility of a sharper bend at the MI/8GeV intersection point with the PD transfer line

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Elaine McCluskey
Fermi National Accelerator Laboratory
FESS Engineering
(630) 840-2193
mccluskey@fnal.gov